

# Annals of Neurology

Vol 41 January June 1997

Official Journal of the American Neurological Association and the Child Neurology Society



## Editor

Robert A. Fishman, MD,  
University of California  
San Francisco, CA

## Founding Editor, 1977-1984

Fred Plum, MD

## Editor, 1985-1992

Arthur K. Asbury, MD

## Associate Editors

Frank M. Longo, MD, PhD,  
San Francisco

Stephen M. Sagar, MD,  
San Francisco

## Associate Editor for Child Neurology

Joseph J. Volpe, MD, Boston

## Editorial Coordinator

Marilyn Stubblebine

## Publisher

Lippincott-Raven Publishers  
Philadelphia, Pennsylvania

## Publishing Staff

Marcia Serepy  
Executive Publisher

Grace R. Caputo  
Senior Production Editor

Nicholas Minicucci Jr.  
Publishing Co., Inc  
Advertising Representative

Martin Stevens, Special Sales

*Annals of Neurology*, ISSN 0364-5134. Published monthly by Lippincott-Raven Publishers, 12107 Insurance Way, Hagerstown, MD 21740. Business offices are located at 227 East Washington Square, Philadelphia, PA 19106-3780. Periodicals postage paid at Hagerstown, MD, and at additional mailing offices.

Send address changes and subscription orders to Lippincott-Raven Publishers, Subscription Department, 12107 Insurance Way, Hagerstown, MD 21740; Call 1-800-638-3030; Fax 301-824-7390; in Maryland, call collect, 301-714-2300. Subscription rates for 1997: Personal subscription, U.S. and possessions, \$176.00; Canada, \$209.00; foreign (includes Mexico), \$254.00. PLEASE ADD 7% CANADIAN GST FOR ALL CANADIAN SUBSCRIPTIONS (Registration No.: 130876246); institutional, U.S., \$274.00; Canada, \$314.00; foreign, \$407.00. Special rates for students, interns, and residents per year: US, \$120.00; Canada, \$153.00; foreign, \$194.00. Single copies \$23.00 prepaid. In JAPAN: Please contact our exclusive agent: MEDSI, 1-2-13 Yushima, Bunkyo-ku, Tokyo 113, Japan.

POSTMASTER: Send address changes to *Annals of Neurology*, 12107 Insurance Way, Hagerstown, MD 21740.

## Editorial Board

M. Flint Beal, MD, Boston

Thomas D. Bird, MD, Seattle

Robert C. Collins, MD, Los Angeles

David R. Cornblath, MD, Baltimore

Jasper R. Daube, MD, Rochester, MN

Kenneth H. Fischbeck, MD,

Philadelphia, PA

Richard S. J. Frackowiak, MD, London

Kirk A. Frey, MD, PhD, Ann Arbor

David A. Greenberg, MD, PhD,

Pittsburgh

Stephen L. Hauser, MD, San Francisco

Gregory L. Holmes, MD, Boston

Edward H. Koo, MD, Boston

Bruce R. Korf, MD, PhD, Boston

Richard P. Mayeux, MD, New York

Henry F. McFarland, MD, Bethesda

Jerry R. Mendell, MD, Columbus, OH

John G. Nutt, MD, Portland, OR

Peter C. O'Brien, PhD, Rochester, MN

John B. Penney, Jr, MD, Boston

Alan K. Percy, MD, Birmingham

Ronald C. Petersen, MD, PhD,  
Rochester, MN

Louis J. Práček II, MD, Salt Lake City

Takehiko Yanagihara, MD, Osaka,  
Japan

*Annals of Neurology* is indexed in Index Medicus, Current Contents/Clinical Medicine, Excerpta Medica, Biological Abstracts, and Psychological Abstracts.

Copyright © 1997 by the American Neurological Association. All rights reserved. Except as authorized in the accompanying statement, no part of *Annals of Neurology* may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without the publisher's written permission. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by the American Neurological Association for libraries and other users registered with the Copyright Clearance Center Transactional Reporting Service, provided that the per-copy fee of \$5.00 is paid directly to the Copyright Clearance Center, 27 Congress St, Salem, MA 01970, for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. The code fee for this journal is 0364-5134/96 \$5.00. This authorization does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copying fees for material published in this journal prior to January 1, 1978, will be charged according to fee rates on file with the Copyright Clearance Center, Inc.



**Lippincott - Raven**  
PUBLISHERS

## Message from the Editor

- 1 Robert A. Fishman, MD

## Editorials

- 4 Recent Advances in Heritable Ataxias  
Orest Hurko, MD
- 7 The Pathology of Alzheimer's Disease: Numbers Count  
Robert D. Terry, MD

## Original Articles

- 8 Familial Episodic Ataxia: Clinical Heterogeneity in Four Families Linked to Chromosome 19p  
Robert W. Baloh, MD, Qing Yue, MD,  
Joseph M. Furman, MD, PhD, and Stanley F. Nelson, MD
- 17 Neuronal Loss Correlates with but Exceeds Neurofibrillary Tangles in Alzheimer's Disease  
Teresa Gómez-Isla, MD, Richard Hollister, BA,  
Howard West, MD, Stina Mui, BA, John H. Growdon, MD,  
Ronald C. Petersen, MD, PhD, Joseph E. Parisi, MD, and  
Bradley T. Hyman, MD, PhD
- 25 A Rapidly Progressive Adolescent-onset Oculopharyngeal Somatic Syndrome with Rimmed Vacuoles in Two Siblings  
Michael R. Rose, MD, David N. Landon, MB, BS,  
Alex Papadimitriou, MD, and John A. Morgan-Hughes, MD
- 32 Activation Mapping in Essential Tremor with Functional Magnetic Resonance Imaging  
Stefan F. Bucher, PhD, Klaus C. Seelos, MD,  
Richard C. Dodel, MD, Maximilian Reiser, MD, and  
Wolfgang H. Oertel, MD
- 41 The Spectrum of Hippocampal Sclerosis: A Quantitative Magnetic Resonance Imaging Study  
W. Van Paesschen, MRCP, A. Connelly, PhD,  
M. D. King, PhD, G. D. Jackson, FRACP, and  
J. S. Duncan, FRCP
- 52 Amyloid (A $\beta$ ) Deposition in Chromosome 1-linked Alzheimer's Disease: The Volga German Families  
D. M. A. Mann, T. Iwatsubo, D. Nochlin, S. M. Sumi,  
E. Levy-Lahad, and T. D. Bird
- 58 Which Clinical Sign of Parkinson's Disease Best Reflects the Nigrostriatal Lesion?  
Francois J. G. Vingerhoets, MD,  
Michael Schulzer, MD, PhD,  
Donald B. Calne, DM, FRCP, and  
Barry J. Snow, MD, FRACP, FRCP
- 65 Bilateral Parasagittal Parietooccipital Polymicrogyria and Epilepsy  
R. Guerrini, MD, F. Dubeau, MD, O. Dulac, MD,  
A. J. Barkovich, MD, R. Kuzniecky, MD, C. Fett, MD,  
M. Jones-Gotman, PhD, R. Canapicchi, MD, H. Cross, MD,  
D. Fish, MD, P. Bonanni, MD, I. Jambaqué, MD, and  
F. Andermann, MD

- 74 Proton Magnetic Resonance Spectroscopic Imaging for Discrimination of Absence and Complex Partial Seizures

Fernando Cendes, MD, Jeff A. Stanley, PhD,  
François Dubeau, MD, Frederick Andermann, MD, and  
Douglas L. Arnold, MD

- 82 Reversible Schwann Cell Hyperplasia and Sprouting of Sensory and Sympathetic Neurites after Intraventricular Administration of Nerve Growth Factor

Jürgen Winkler, MD, Gilbert A. Ramirez, MS,  
H. Georg Kubn, PhD, Daniel A. Peterson, PhD,  
Patricia A. Day-Lollini, PhD, Gregory R. Stewart, PhD,  
Mark A. Tuszynski, MD, PhD, Fred H. Gage, PhD, and  
Leon J. Thal, MD

- 94 Skew Deviation Following Vestibular Nerve Surgery

P. Riordan-Eva, FRCP, J. P. Harcourt, FRCS,  
M. Faldon, PhD, G. B. Brookes, FRCS, and  
M. A. Gresty, PhD

## Brief Communications

- 100 Inclusion Body Myositis and Paraproteinemia: Incidence and Immunopathologic Correlations

Marinos C. Dalakas, MD, Isabel Illa, MD,  
Eduard Gallardo, PhD, and Candido Juez, PhD

- 104 Patients Homozygous for the 17p11.2 Duplication in Charcot-Marie-Tooth Type 1A Disease

E. LeGuern, MD, PhD, R. Gouider, MD, D. Mabin, MD,  
S. Tardieu, BS, N. Birouk, MD, P. Parent, MD,  
P. Bouche, MD, and A. Brice, MD

- 108 Stereotactic Thalamotomy in Tremor-dominant Parkinson's Disease: An H<sub>2</sub><sup>15</sup>O PET Motor Activation Study

Henning Boecker, MD, Adrian J. Wills, MRCP,  
Andres Ceballos-Baumann, MD, Michael Samuel, MRCP,  
David G. T. Thomas, FRCS, C. David Marsden, FRS, and  
David J. Brooks, MD, FRCP

- 111 Adult-onset Krabbe's Disease in Siblings with Novel Mutations in the Galactocerebrosidase Gene

Gary L. Bernardini, MD, PhD,  
Daniel G. Herrera, MD, PhD, Debbie Carson, RN,  
Rita DeGasperi, PhD, Miguel A. Gama Sosa, PhD,  
Edwin H. Kolodny, MD, and Rosario Trifiletti, MD, PhD

- 114 Mitochondrial Function in Muscle from Elderly Athletes

Elizabeth J. Brierley, MB BS, MRCP,  
Margaret A. Johnson, BSc, PhD,  
Andrew Bowman, MB ChB, MRCP,  
Gary A. Ford, MB BChir, FRCP, Feisal Subhan, BSc,  
James W. Reed, BSc, PhD, Oliver F. W. James, BCh, FRCP,  
and Douglass M. Turnbull, MB BS, MD, PhD, FRCP

- 117 X-Linked Vacuolated Myopathy: Membrane Attack Complex Deposition on Muscle Fiber Membranes with Calcium Accumulation on Sarcolemma

Jean-Pierre Louboutin, MD, PhD, Marcello Villanova, MD,  
Brigitte Lucas-Héron, PhD, and Michel Fardeau, MD

## Expedited Publication

### 121 Collection and Normal Levels of the Amyloid Precursor Protein in Plasma

Scott Whyte, FRACP, Neil Wilson, BAppSci,  
Jon Currie, FRACP, Paul Maruff, PhD,  
Valencia Malone, RN, Russana Shafiq-Antonacci, BAppSci,  
Peter Tyler, BAppSci, Kathryn L. Derry, BSc,  
John Underwood, PhD, Qiao-Xin Li, PhD,  
Konrad Beyreuther, PhD, and Colin L. Masters, MD

## Special Report

### 125 The Role of MRI in Clinical Trials of Multiple Sclerosis: Comparison of Image Processing Techniques

A. C. Evans, PhD, J. A. Frank, MD, J. Antel, MD, and  
D. H. Miller, MD

## Letters

### 133 Trihexyphenidyl Withdrawal Encephalopathy

Ken Johkura, MD, Shunsake Matsumoto, MD,  
Osamu Hasegawa, MD, and Yoshiyuki Kuroiwa, MD

### 134 Early Copper Histidine Therapy in Classic Menkes Disease

Bibudhendra Sarkar, PhD

### 134 Reply

Stephen G. Kaler, MD

## Regular Departments

### 137 Books

## NO 2 FEBRUARY 1997

## Editorials

### 139 Frontotemporal Dementia Is on the MAPr

Kirk C. Wilhelmsen, MD, PhD

### 141 Mitochondrial Function in Huntington's Disease: Clues for Pathogenesis and Prospects for Treatment

A. H. V. Schapira, MD

## Special Report

### 143 Optic Pathway Gliomas in Children with Neurofibromatosis 1: Consensus Statement from the NF1 Optic Pathway Glioma Task Force

Robert Listerick, MD, David N. Louis, MD,  
Roger J. Packer, MD, and David H. Gutmann, MD, PhD

## Original Articles

### 150 Hereditary Frontotemporal Dementia Is Linked to Chromosome 17q21-q22: A Genetic and Clinicopathological Study of Three Dutch Families

P. Heutink, PhD, M. Stevens, MD, P. Rizzu, MSc,  
E. Bakker, PhD, J. M. Kros, MD, PhD, A. Tibben, PhD,  
M. F. Niermeijer, MD, PhD, C. M. van Duijn, PhD,  
B. A. Oostra, PhD, and J. C. van Swieten, MD, PhD

### 160 Energy Metabolism Defects in Huntington's Disease and Effects of Coenzyme Q<sub>10</sub>

Walter J. Koroshetz, MD, Bruce G. Jenkins, PhD,  
Bruce R. Rosen, MD, PhD, and M. Flint Beal, MD

### 166 Familial Risk of Migraine: A Population-based Study

Walter F. Stewart, PhD, Judy Staffa, BS,  
Richard B. Lipton, MD, and Ruth Ortman, PhD

### 173 Muscle-Eye-Brain Disease: A Neuropathological Study

M. Haltia, MD, I. Leivo, MD, H. Somer, MD,  
H. Pihko, MD, A. Paetau, MD, T. Kivelä, MD,  
A. Tarkkanen, MD, F. Tomé, MD, E. Engvall, MD, and  
P. Santavuori, MD

### 181 Botulinum Toxin Treatment of Muscle Cramps: A Clinical and Neurophysiological Study

Laura Bertolasi, MD, Alberto Priori, MD, PhD,  
Giuliano Tomelleri, MD, Luigi G. Bongiovanni, MD,  
Emiliana Fincati, MD, Alessandro Simonati, MD,  
Domenico De Grandis, MD, and Nicolo' Rizzuto, MD

### 187 Acute and Chronic Effects of Hypoxia on the Developing Hippocampus

James Owens, Jr, PhD, Carol A. Robbins, BS,  
H. Jurgen Wenzel, MD, DSc, and  
Philip A. Schwartzkroin, PhD

### 200 Sequestration of RNA in Alzheimer's Disease Neurofibrillary Tangles and Senile Plaques

Stephen D. Ginsberg, PhD, Peter B. Crino, MD, PhD,  
Virginia M.-Y. Lee, PhD, James H. Eberwine, PhD, and  
John Q. Trojanowski, PhD

### 210 Epidemiology of Mutations in Superoxide Dismutase in Amyotrophic Lateral Sclerosis

M. E. Cudkowicz, MD, D. McKenna-Yasek, RN,  
P. E. Sapp, BS, W. Chin, BS, B. Geller, BS,  
D. L. Hayden, MS, D. A. Schoenfeld, PhD,  
B. A. Hosler, PhD, H. R. Horvitz, PhD, and  
R. H. Brown, PhD

### 222 Dopaminergic Function in Familial Parkinson's Disease: A Clinical and <sup>18</sup>F-Dopa Positron Emission Tomography Study

P. Piccini, MD, P. K. Morrish, MRCP, N. Turjanski, MD,  
G. V. Sawle, DM, D. J. Burn, MD, R. A. Weeks, MD,  
M. H. Mark, MD, D. M. Maraganore, MD,  
A. J. Lees, MD, and D. J. Brooks, MD

### 230 Deletion and Conversion in Spinal Muscular Atrophy Patients: Is There a Relationship to Severity?

Christine J. DiDonato, PhD, Susan E. Ingraham, BS,  
Jerry R. Mendell, MD, Thomas W. Prior, PhD,  
Sharon Lenard, MS, Richard T. Moxley III, MD,  
Julaine Florence, MHS, and Arthur H. M. Burghes, PhD

- 238 **Autoantibodies Detected to Expressed K<sup>+</sup> Channels Are Implicated in Neuromyotonia**

Ian K. Hart, MRCP, Caroline Waters, BSc,  
Angela Vincent, MRCP, Claire Newland, PhD,  
David Beeson, PhD, Olaf Pongs, PhD, Christine Morris,  
PhD, and John Newsom-Davis, FRS

- 247 **Involvement of the Ipsilateral Motor Cortex in Finger Movements of Different Complexities**

Robert Chen, MBChB, FRCP, Christian Gerloff, MD,  
Mark Hallett, MD, and Leonardo G. Cohen, MD

- 255 **Motion Direction Discrimination in Blind Hemifields**

Jason J. S. Barton, MD, PhD, FRCP, and  
James A. Sharpe, MD, FRCP

## Brief Communications

- 265 **Maternal Inheritance in Parkinson's Disease**

G. Frederick Wooten, MD, Lillian J. Currie, PhD, RN,  
James P. Bennett, MD, PhD, Madeline B. Harrison, MD,  
Joel M. Trugman, MD, and W. Davis Parker, Jr, MD

- 268 **Molecular Analysis of Cytochrome c Oxidase Deficiency in Leigh's Syndrome**

Paula L. Adams, BSc, Robert N. Lightowler, PhD, and  
Douglas M. Turnbull, MD

- 271 **Plasma Levels of Amyloid  $\beta$  Proteins A $\beta$ 1-40 and A $\beta$ 1-42(43) Are Elevated in Down's Syndrome**

Takahiko Tokuda, MD, PhD, Tetsuro Fukushima, MS,  
Shu-ich Ikeda, MD, PhD, Yoshiki Sekijima, MD,  
Shin'ichi Shoji, MD, PhD, Nobuo Yanagisawa, MD, PhD,  
and Akira Tamaoka, MD, PhD

- 273 **Pupil-involving Third-nerve Palsy and Carotid Stenosis: Rapid Recovery Following Endarterectomy**

L. J. Balcer, MD, S. L. Galetta, MD, D. M. Yousem, MD,  
M. A. Golden, MD, and A. K. Asbury, MD

## Expedited Publication

- 277 **Genetic Evidence for the Involvement of  $\tau$  in Progressive Supranuclear Palsy**

Chris Conrad, BS, Athena Andreadis, PhD,  
John Q. Trojanowski, MD, PhD, Dennis W. Dickson, MD,  
David Kang, MS, Xiaohua Chen, MD,  
Wigbert Wiederholt, MD, Larry Hansen, MD,  
Eliezer Masliah, MD, Leon J. Thal, MD,  
Robert Katzman, MD, Yu Xia, MS, and  
Tsunao Saitoh, PhD

## Letters

- 282 **Selegiline and Mortality in Parkinson's Disease: Another View**

A. J. Lees, J. Head, and Y. B. Shlomo

- 283 **Financial Influences on Career Choices in Neurology**

David M. Feinberg, MD

- 284 **Reply**

Susan S. Spencer, MD

## Regular Departments

- 285 **Books**

## NO 3 MARCH 1997

## Editorial

- 287 **Changing Views of Guillain-Barré Syndrome**

Arthur K. Asbury, MD, and Guy M. McKhann, MD

## Neurological Progress

- 289 **Understanding Circadian Clocks: From c-Fos to Fly Balls**

William J. Schwartz, MD

## Original Articles

- 298 **Appropriate Number of Plasma Exchanges in Guillain-Barré Syndrome**

The French Cooperative Group on Plasma Exchange in  
Guillain-Barré Syndrome

- 307 **Transthyretin Amyloidosis: A New Mutation Associated with Dementia**

R. B. Petersen, PhD, H. Goren, MD, M. Cohen, MD,  
S. L. Richardson, MS, N. Tresser, MD, A. Lynn, MS,  
M. Gali, BS, M. Estes, MD, and P. Gambetti, MD

- 314 **Oculomotor Nerve and Muscle Abnormalities in Congenital Fibrosis of the Extraocular Muscles**

Elizabeth C. Engle, MD, Boyan C. Goumnerov, MD,  
Craig A. McKeown, MD, Martha Schatz, MD,  
Donald R. Johns, MD, John D. Porter, PhD, and  
Alan H. Beggs, PhD

- 326 **Soluble Adhesion Molecules (sVCAM-1 and sICAM-1) in Cerebrospinal Fluid and Serum Correlate with MRI Activity in Multiple Sclerosis**

Peter Rieckmann, MD, Bernd Altenhofen, MD, Antje Riegel,  
Jürgen Baudewig, MSc, and Klaus Felgenhauer, MD

- 334 **Differential Effects of Levodopa on Dopaminergic Function in Early and Advanced Parkinson's Disease**

Richard Torstenson, MSc, Per Hartvig, PharmD, PhD,  
Bengt Långström, PhD, Göran Westerberg, PhD, and  
Joakim Tedroff, MD, PhD

- 341 **Genetic Predisposition to Multiple Sclerosis as Revealed by Immunoprinting**

Cornelia Epplen, MD, Silke Jäckel,  
Eduardo J. M. Santos, MSc, Marcus D'Souza,  
Dieter Poehlau, MD, Bernd Dotzauer, Eckhart Sindern, MD,  
Michael Haupts, MD, Klaus-Peter Rüdte, MD,  
Frank Weber, MD, Jens Stöver, Sigrid Poser, MD,  
Walter Gehler, MD, Jean-Pierre Malin, MD,  
Horst Przuntek, MD, and Jörg T. Epplen, MD

- 353 **Treatment of Ramsay Hunt Syndrome with Acyclovir-Prednisone: Significance of Early Diagnosis and Treatment**

Shingo Murakami, MD, Naohito Hato, MD,  
Joji Horiuchi, MD, Nobumitsu Honda, MD,  
Kiyofumi Gyo, MD, and Naoaki Yanagihara, MD

- 358 **Imaging of  $\delta$ - and  $\mu$ -Opioid Receptors in Temporal Lobe Epilepsy by Positron Emission Tomography**

Igal Madar, PhD, Ronald P. Lesser, MD,  
Gregory Krauss, MD, Jon Kar Zubieta, MD, PhD,  
John R. Lever, PhD, Chris M. Kinter, PhD,  
Hayden T. Ravert, PhD, John L. Musachio, PhD,  
William B. Mathews, PhD, Robert F. Dannals, PhD,  
and J. James Frost, MD, PhD

- 368 **Pathological Correlates of Extrapyramidal Signs in Alzheimer's Disease**

Yan Liu, MD, MS, Yaakov Stern, PhD,  
Michael R. Chun, MD, Diane M. Jacobs, PhD,  
Patricia Yau, and James E. Goldman, MD, PhD

- 375 **Mononeuropathy Multiplex in Rhesus Monkeys with Chronic Lyme Disease**

John D. England, MD, Rudolf P. Bohm, Jr, DVM,  
E. Donald Roberts, DVM, PhD, and Mario T. Philipp, PhD

- 385 **Imaging of Axonal Damage in Multiple Sclerosis: Spatial Distribution of Magnetic Resonance Imaging Lesions**

S. Narayanan, MSc, L. Fu, MSc, E. Pioro, MD, DPhil,  
N. De Stefano, MD, D. L. Collins, PhD, G. S. Francis, MD,  
J. P. Antel, MD, P. M. Matthews, MD, DPhil, and  
D. L. Arnold, MD

- 392 **Correlation of Clinical, Magnetic Resonance Imaging, and Cerebrospinal Fluid Findings in Optic Neuritis**

Lawrence D. Jacobs, MD, Samer E. Kaba, MD,  
Colleen M. Miller, RN, CNS, Roger L. Priore, ScD, and  
Carol M. Brounschidle, PhD

## Brief Communications

- 399 **A Japanese Family Carrying a Novel Mutation in the Emery-Dreifuss Muscular Dystrophy Gene**

Yaeko Ichikawa, MD, Masahiko Watanabe, MD,  
Hisatomo Kowa, MD, Shigeo Murayama, MD,  
Takehiko Mizuno, MD, Issei Komuro, MD,  
Ryouji Ishiki, MD, Jun Goto, MD, and  
Ichiro Kanazawa, MD

- 402 **Increased Apolipoprotein E  $\epsilon 4$  in Epilepsy with Senile Plaques**

Gunnar K. Gouras, MD, Norman R. Relkin, MD, PhD,  
David Sweeney, BA, David G. Munoz, MD,  
Ian R. Mackenzie, MD, and Sam Gandy, MD, PhD

- 404 **Use of Desferrioxamine in the Treatment of Aceruloplasminemia**

Hiroaki Miyajima, MD, Yoshitomo Takahashi, MD,  
Tadashi Kamata, MD, Hideaki Shimizu, MD,  
Naoki Sakai, MD, and Jonathan D. Gitlin, MD

- 408 **A Novel Mitochondrial tRNA Phenylalanine Mutation Presenting with Acute Rhabdomyolysis**

P. F. Chinnery, MRCP, M. A. Johnson, PhD,  
R. W. Taylor, PhD, R. N. Lightowlers, PhD, and  
D. M. Turnbull, FRCP

## Letters

- 411 **Delayed OEF Elevation is an Unreliable Index of Tissue at Risk**

Myron D. Ginsberg, MD

- 412 **Reply**

J. C. Baron, MD, M. Furlan, MD, and  
G. Marchal, MD, PhD

- 414 **Prediction for Unimpaired Subjects Is Different from Diagnosis of Demented Patients**

Allen D. Roses, MD, and Ann M. Saunders, PhD

- 415 **Reply**

Bradley T. Hyman, MD, PhD, and Robert B. Wallace, MD

- 416 **Early American Professorships in Neurology**

Richard F. Mayer, MD, and Gregory K. Bergey, MD

- 417 **Reply**

Christopher G. Goetz, MD, and Eric J. Pappert, MD

- 417 **Lack of Association of Apolipoprotein E  $\epsilon 4$  Allele with Bulbar-onset Motor Neuron Disease**

Rainer Bachus, MD, Sebastian Bader,  
Reinhard Gefner, MD, PhD, and Albert C. Ludolph, MD

## Regular Departments

- 418 **Books**

## NO 4 APRIL 1997

### Editorials

- 419 **Ocular Muscle Involvement by Myasthenia Gravis**

Henry J. Kaminski, MD, and Robert L. Ruff, MD, PhD

- 421 **New Developments in Hereditary Inclusion Body Myopathies**

Valerie Askanas, MD, PhD

### Original Articles

- 423 **Acetylcholine Receptor Expression in Human Extraocular Muscles and Their Susceptibility to Myasthenia Gravis**

C. MacLennan, BA, D. Beeson, PhD, A.-M. Buijs, BA,  
A. Vincent, MRCP, and J. Newsom-Davis, FRS



- 432 **Gene Locus for Autosomal Recessive Distal Myopathy with Rimmed Vacuoles Maps to Chromosome 9**  
*Takeshi Ikeuchi, MD, Tomoya Asaka, MD, Masaaki Saito, MD, Hajime Tanaka, MD, Sari Higuchi, MD, Keiko Tanaka, MD, Kyoko Saido, MD, Eiichi Uryama, MD, Hidenobu Mizusawa, MD, Nobuyoshi Fukuhara, MD, Ikuya Nonaka, MD, Masaharu Takamori, MD, and Shoji Tsuji, MD*
  - 438 **Peripheral Neuropathy in Human Immunodeficiency Virus-infected Patients with the Diffuse Infiltrative Lymphocytosis Syndrome**  
*Antoine Moulignier, MD, François-Jérôme Authier, MD, Marielle Baudrimont, MD, PhD, Gilles Pialoux, MD, Laurent Belec, MD, PhD, Marc Polivka, MD, Bernard Clair, MD, Françoise Gray, MD, PhD, Jacqueline Mikol, MD, and Romain K. Gherardi, MD*
  - 446 **Machado-Joseph Disease: Clinical, Molecular, and Metabolic Characterization in Chinese Kindreds**  
*Bing-wen Soong, MD, PhD, Chung-hui Cheng, BS, Ren-shyan Liu, MD, and Din-e Shan, MD, PhD*
  - 453 **Machado-Joseph Disease Gene Product Is a Cytoplasmic Protein Widely Expressed in Brain**  
*Henry L. Paulson, MD, PhD, Sonal S. Das, BA, Peter B. Crino, MD, PhD, Matthew K. Perez, MS, Sonal C. Patel, Denise Gotsdiner, MD, Kenneth H. Fischbeck, MD, and Randall N. Pittman, PhD*
  - 463 **Clinical and Pathological Phenotype of the Original Family with Charcot-Marie-Tooth Type 1B: A 20-Year Study**  
*Thomas D. Bird, MD, George H. Kraft, MD, Hillary P. Lipe, RN, Kimbra L. Kenney, MD, and S. Mark Sumi, MD*
  - 470 **<sup>1</sup>H-Magnetic Resonance Spectroscopy-Determined Cerebral Lactate and Poor Neurological Outcomes in Children with Central Nervous System Disease**  
*Stephen Ashwal, MD, Barbara A. Holshouser, PhD, Lawrence G. Tomasi, MD, Stanford Shu, MD, Ronald M. Perkin, MD, Gerald A. Nyström, MD, and David B. Hinshaw, Jr, MD*
  - 482 **Health-related Quality of Life and Seizure Control in Temporal Lobe Epilepsy**  
*Richard S. McLachlan, MD, Kristopher J. Rose, BA, Paul A. Derry, PhD, Casey Bonnar, BScN, Warren T. Blume, MD, and John P. Girvin, MD*
  - 490 **Correlation of Widespread Preoperative Magnetic Resonance Imaging Changes with Unsuccessful Surgery for Hippocampal Sclerosis**  
*S. M. Sisodiya, MRCP, PhD, N. Moran, MRCP, S. L. Free, PhD, N. D. Kitchen, MD, FRCS(SN), J. M. Stevens, FRCP, W. F. J. Harkness, FRCS, D. R. Fish, MD, FRCP, and S. D. Shorvon, MD, FRCP*
  - 497 **Midbrain Dopaminergic Neuronal Degeneration in a Transgenic Mouse Model of Familial Amyotrophic Lateral Sclerosis**  
*V. Kostic, MD, PhD, M. E. Gurney, PhD, H.-X. Deng, PhD, T. Siddique, MD, C. J. Epstein, MD, and S. Przedborski, MD, PhD*
  - 505 **Brain Regional Differences in the Expansion of a CAG Repeat in the Spinocerebellar Ataxias: Dentatorubral-Pallidoluysian Atrophy, Machado-Joseph Disease, and Spinocerebellar Ataxia Type 1**  
*Hideji Hashida, Jun Goto, Hiroshi Kurisaki, Hidehiro Mizusawa, and Ichiro Kanazawa*
  - 512 **A Familial Syndrome of Congenital Cataract, Mental Impairment, and Dentate Gyrus Atrophy**  
*Arthur J. Hudson, MD, FRCP(C), and David G. Munoz, MD, FRCP(C)*
  - 521 **Marked Age-dependent Neuroprotection by Brain-derived Neurotrophic Factor Against Neonatal Hypoxic-Ischemic Brain Injury**  
*Yu Cheng, MD, Jeffrey M. Gidday, PhD, Qiao Yan, PhD, Aarti R. Shah, MS, and David M. Holtzman, MD*
  - 530 **Immunochemical Analysis of Dopamine Transporter Protein in Parkinson's Disease**  
*Gary W. Miller, PhD, Julie K. Staley, PhD, Craig J. Heilman, BS, Jeffrey T. Perez, BS, Deborah C. Mash, PhD, David B. Rye, MD, PhD, and Allan I. Levey, PhD*
  - 540 **Cortical Peptide Changes in Huntington's Disease May Be Independent of Striatal Degeneration**  
*Michael F. Mazurek, MD, FRCP(C), Sarah Garside, MD, and M. Flint Beal, MD*
- ## Brief Communications
- 548 **Various Types of Hereditary Inclusion Body Myopathies Map to Chromosome 9p1-q1**  
*Zohar Argov, MD, Efrat Tiram, BSc, Iris Eisenberg, BSc, Menahem Sadeh, MD, Christine E. Seidman, MD, J. G. Seidman, PhD, George Karpati, MD, and Stella Mitrani-Rosenbaum, PhD*
  - 551 **Expression of the Copper-Zinc Superoxide Dismutase Gene in Amyotrophic Lateral Sclerosis**  
*Kazutoshi Nishiyama, MD, PhD, Shigeo Murayama, MD, PhD, Shin Kwak, MD, PhD, and Ichiro Kanazawa, MD, PhD*
  - 556 **Complex I Function in Familial and Sporadic Dystonia**  
*A. H. V. Schapira, T. Warner, M. T. Gash, M. W. J. Cleeter, C. F. M. Marinbo, and J. M. Cooper*
- ## Letters
- 560 **Identity of Interferon- $\beta$ 1a Product in Multiple Sclerosis Study**  
*Wieland W. Wolf, PhD*
  - 560 **Reply**  
*Lawrence Jacobs, MD*
  - 560 **Central Nervous System Whipple's Disease**  
*Wim I. M. Verhagen, MD, PhD, Patrick L. M. Huygen, PhD, and Johanna E. Dalman, MD*
  - 561 **Treatment Guidelines in Central Nervous System Whipple's Disease**  
*P. J. Schmitter, MD, E. C. Reisinger, MD, T. Berger, MD, G. J. Krejs, MD, and E. Auff, MD*

- 562 **Reply**  
E. D. Louis, MD, MS, T. Lynch, MRCPI, S. Fahn, MD,  
and J. Odel, MD

- 562 **Long-range Planning of Neurology**  
Walter G. Bradley, DM, FRCP

- 563 **The Vehicle for Cyclosporine Is Neurotoxic In Vitro**  
Anthony J. Windebank, MD

- 563 **Reply**  
Dennis W. Choi, MD, PhD, Mark D. Goldberg, MD, and  
John W. McDonald, MD, PhD

## Regular Departments

- 564 **Correction**

NO 5 MAY 1997

## Editorials

- 565 **Diffusion-weighted MRI: An ECG for "Brain Attack"?**  
Walter J. Koroshetz, MD, and Gilberto Gonzalez, MD, PhD

- 567 **Diffusion-weighted MRI for Diagnosis and Treatment  
of Ischemic Stroke**  
Justin A. Zivin, MD, PhD

## Special Report

- 569 **The Quest for Unbiased Research: Randomized Clinical  
Trials and the CONSORT Reporting Guidelines**  
Kenneth F. Schulz, PhD, MBA

## Original Articles

- 574 **Clinical Utility of Diffusion-weighted Magnetic  
Resonance Imaging in the Assessment of Ischemic  
Stroke**  
H. L. Lutsep, MD, G. W. Albers, MD, A. DeCrespigny, PhD,  
G. N. Kamat, MD, M. P. Marks, MD, and  
M. E. Moseley, PhD

- 581 **Enlargement of Human Cerebral Ischemic Lesion  
Volumes Measured by Diffusion-weighted Magnetic  
Resonance Imaging**  
Alison E. Baird, FRACP, PhD, Andrew Benfield, BS,  
Gottfried Schlaug, MD, Bettina Siewert, MD,  
Karl-Olof Lövblad, MD, Robert R. Edelman, MD, and  
Steven Warach, MD, PhD

- 590 **Brain Impairment in Well-nourished Chronic Alcoholics  
Is Related to Ethanol Intake**  
Josep M. Nicolás, MD, Ramón Estruch, MD,  
Manel Salameo, MD, Nuria Orteu, MD,  
Joaquim Fernandez-Solà, MD, Emilio Sacanella, MD, and  
Alvaro Urbano-Márquez, MD

- 599 **Regional and Cellular Expression of the Dentatorubral-  
Pallidolysian Atrophy Gene in Brains of Normal and  
Affected Individuals**  
K. Nishiyama, MD, PhD, K. Nakamura, MD, PhD,  
S. Murayama, MD, PhD, M. Yamada, PhD, and  
I. Kanazawa, MD, PhD

- 606 **Atrophy of the Corpus Callosum, Cognitive  
Impairment, and Cortical Hypometabolism in  
Progressive Supranuclear Palsy**  
Hiroshi Yamauchi, MD, PhD,  
Hidenao Fukuyama, MD, PhD, Yasuhiro Nagahama, MD,  
Yukinori Katsumi, MD, Yun Dong, MD,  
Junji Konishi, MD, PhD, and Jun Kimura, MD

- 615 **The Absence of an Apolipoprotein  $\epsilon 4$  Allele Is  
Associated with a More Aggressive Form of  
Alzheimer's Disease**

Yaakov Stern, PhD, Jason Brandt, PhD,  
Marilyn Albert, PhD, Diane M. Jacobs, PhD,  
Xinhua Liu, PhD, Karen Bell, MD, Karen Marder, MD,  
Mary Sano, PhD, Steven Albert, PhD,  
Caridad Del-Castillo Castenada, BA, Fred Bylsma, PhD,  
Ben Tycko, MD, and Richard Mayeux, MD

- 621 **Cortical Reorganization in Patients with Facial Palsy**  
Michel Rijntjes, Martin Tegenthoff, MD,  
Joachim Liepert, MD, Georg Leonhardt, MD,  
Sylvia Kotterba, MD, Stephan Müller, MD,  
Stephan Kiebel, Jean-Pierre Malin, MD,  
Hans-Christoph Diener, MD, and Cornelius Weiller, MD

- 631 **Juvenile-onset Spinal Muscular Atrophy Caused by  
Compound Heterozygosity for Mutations in the  
HEXA Gene**  
Ruth Navon, PhD, Rami Khosravi, Judith Melki, MD, PhD,  
Liat Drucker, MSc, Bertrand Fontaine, MD, PhD,  
Jean Claude Turpin, MD, PhD, Bathien N'Guyen, MD,  
Michel Fardeau, MD, Pierre Rondot, MD, and  
Nicole Baumann, MD, PhD

- 639 **Cerebral Generators Involved in the Pathogenesis of the  
Restless Legs Syndrome**  
Stefan F. Bucher, PhD, Klaus C. Seelos, MD,  
Wolfgang H. Oertel, MD, Maximilian Reiser, MD, and  
Claudia Trenkwalder, MD

- 646 **Oxidative Damage and Metabolic Dysfunction in  
Huntington's Disease: Selective Vulnerability of the  
Basal Ganglia**  
Susan E. Browne, PhD, Allen C. Bowling, MD, PhD,  
Usha MacGarvey, MSc, M. Jay Baik, BS,  
Stephanie C. Berger, BS, Miratul M. K. Muqit, BSc,  
Edward D. Bird, MD, and M. Flint Beal, MD

- 654 **Leukodystrophy in Patients with Ovarian Dysgenesis**  
Raphael Schiffmann, MD, Gioacchino Tedeschi, MD,  
R. Philip Kinkel, MD, Bruce D. Trapp, PhD,  
Joseph A. Frank, PhD, Christine R. Kaneski, MS,  
Roscoe O. Brady, MD, Norman W. Barton, MD, PhD,  
Lawrence Nelson, MD, and Jack A. Yanovski, MD, PhD

- 662 **Periventricular Nodular Heterotopia and Intractable  
Temporal Lobe Epilepsy: Poor Outcome after Temporal  
Lobe Resection**  
L. M. Li, MD, F. Dubeau, MD, F. Andermann, MD,  
D. R. Fish, MD, C. Watson, MD, PhD,  
G. D. Cascino, MD, S. F. Berkovic, MD, N. Moran, MD,  
J. S. Duncan, MD, A. Olivier, MD, PhD, R. Leblanc, MD,  
and W. Harkness, MD

- 669 **Increases in Soluble VCAM-1 Correlate with a Decrease in MRI Lesions in Multiple Sclerosis Treated with Interferon  $\beta$ -1b**

Peter A. Calabresi, MD, Laura R. Tranquill, MS, James M. Dambrosia, PhD, Lael A. Stone, MD, Heidi Maloni, RN, Craig N. Bash, MD, Joseph A. Frank, MD, and Henry F. McFarland, MD

- 675 **Phenotypic Variability in Friedreich Ataxia: Role of the Associated GAA Triplet Repeat Expansion**

Laura Montermini, PhD, Andrea Richter, PhD, Kenneth Morgan, PhD, Cristina M. Justice, BS, Dominique Julien, BS, Barbara Castellotti, MS, Jocelyne Mercier, BS, Josée Poirier, BS, Fiorentino Capozzoli, MD, Jean-Pierre Bouchard, MD, Bernard Lemieux, MD, Jean Mathieu, MD, Michel Vanasse, MD, Marie-Hélène Seni, RT, Gail Graham, MD, Frederick Andermann, MD, Eva Andermann, MD, PhD, Serge B. Melançon, MD, Bronya J. B. Keats, PhD, Stefano Di Donato, MD, and Massimo Pandolfo, MD

## Brief Communications

- 683 **Endoglin Gene Polymorphism as a Risk Factor for Sporadic Intracerebral Hemorrhage**

M. J. Alberts, MD, J. P. Davis, BA, C. Graffagnino, MD, C. McClenny, RN, D. Delong, PhD, C. Granger, MD, M. H. Herbstreith, BS, K. Boteva, MD, D. A. Marchuk, PhD, and A. D. Roses, MD

- 686 **Allelic Heterogeneity of Mediterranean Myoclonus and the Cystatin B Gene**

Pierre Labauge, MD, Réda Ouazzani, MD, Amel M'Rabet, MD, Djamel Grid, MD, Pierre Genton, MD, Charlotte Dravet, MD, Taieb Chkili, MD, Corrine Beck, PhD, Catherine Buresi, MD, Michel Baldy-Moulinier, MD, and Alain Malafosse, MD

- 689 **CAG Repeat Number Governs the Development Rate of Pathology in Huntington's Disease**

John B. Penney, Jr, MD, Jean-Paul Vonsattel, MD, Marcy E. MacDonald, PhD, James F. Gusella, PhD, and Richard H. Myers, PhD

- 693 **A Subset of Senile Dementia with High Incidence of the Apolipoprotein E  $\epsilon$ 2 Allele**

Kenji Ikeda, MD, PhD, Harubiko Akiyama, MD, PhD, Tetsuaki Arai, MD, Naruhiko Sahara, MA, Hiroshi Mori, PhD, Mihoko Usami, PhD, Masuhiro Sakata, MD, Toshio Mizutani, MD, PhD, Koichi Wakabayashi, MD, PhD, and Hitoshi Takahashi, MD, PhD

- 695 **Dutch Hereditary Cerebral Amyloid Angiopathy: Structural Lesions and Apolipoprotein E Genotype**

M. Bornebroek, MD, J. Haan, MD, PhD, S. G. Van Duinen, MD, PhD, M. L. C. Maat-Schieman, MD, M. A. Van Buchem, MD, PhD, E. Bakker, PhD, C. Van Broeckhoven, PhD, and R. A. C. Roos, MD, PhD

## Regular Departments

- 698 **Correction**

## NO 6 JUNE 1997

### Message from the Editor

- 699 Robert A. Fishman, MD

### The New Editor of the *Annals*

- 700 Arthur K. Asbury, MD

### Editorial

- 701 **Cerebral Amyloid Angiopathy and Apolipoprotein E: Bad News for the Good Allele?**

Steven M. Greenberg, MD, PhD, and Bradley T. Hyman, MD, PhD

### Point of View

- 703 **Paraneoplastic Primary Lateral Sclerosis and Amyotrophic Lateral Sclerosis**

Lewis P. Rowland, MD

### Special Report

- 706 **Frontotemporal Dementia and Parkinsonism Linked to Chromosome 17: A Consensus Conference**

Norman L. Foster, MD, Kirk Wilhelmsen, MD, PhD, Anders A. F. Sima, MD, PhD, Margaret Z. Jones, MD, Constance J. D'Amato, BS, Sid Gilman, MD, and Conference Participants

### Original Articles

- 716 **High Frequency of Apolipoprotein E  $\epsilon$ 2 Allele in Hemorrhage Due to Cerebral Amyloid Angiopathy**

James A. R. Nicoll, MD, Clair Burnett, Seth Love, PhD, David I. Graham, MB, Debbie Dewar, PhD, James W. Ironside, MB, Janice Stewart, and Harry V. Vinters, MD

- 722 **Motor Neuron Syndromes in Cancer Patients**

P. A. Forsyth, MD, J. Dalmau, MD, PhD, F. Graus, MD, V. Cwik, MD, M. K. Rosenblum, MD, and J. B. Posner, MD

- 731 **Altered Intrathymic T-Cell Repertoire in Human Myasthenia Gravis**

Frédérique Truffault, MSc, Sylvia Cohen-Kaminsky, PhD, Iman Khalil, PhD, Philippe Levasseur, MD, and Sonia Berrib-Aknin, PhD



**742 Presenilin-1 Protein Expression in Familial and Sporadic Alzheimer's Disease**

Allan I. Levey, MD, PhD, Craig J. Heilman, BS, James J. Lah, MD, PhD, Norman R. Nash, BS, Howard D. Rees, PhD, Masakazu Wakai, MD, Suzanne S. Mirra, MD, David B. Rye, MD, PhD, David Nochlin, MD, Thomas D. Bird, MD, and Elliott J. Mufson, PhD

**754 Magnetic Resonance Imaging of Periventricular Leukomalacia and Its Clinical Correlation in Children**

Päivi Olsén, MD, Eija Pääkkö, MD, Leena Vainionpää, MD, Juhani Pyhtinen, MD, and Marjo-Riitta Järvelin, MD

**762 Painful Proximal Diabetic Neuropathy: Inflammatory Nerve Lesions and Spontaneous Favorable Outcome**

Gérard Said, Fabienne Elgrably, Catherine Lacroix, Violaine Planté, Céline Talamon, David Adams, Michel Tager, and Gérard Slama

**771 A New Type of Hereditary Motor and Sensory Neuropathy Linked to Chromosome 3**

Hiroshi Takashima, MD, Masanori Nakagawa, MD, Keiichi Nakahara, MD, Masahito Suehara, MD, Toshio Matsuzaki, MD, Itsuro Higuchi, MD, Hidemasa Higa, MD, Kimiyoshi Arimura, MD, Teruo Iwamasa, MD, Shuji Izumo, MD, and Mitsuhiro Osame, MD

**781 A Mismatch Between Kinesthetic and Visual Perception in Parkinson's Disease**

Mehmet Demirci, MD, Stephen Grill, MD, PhD, Lisa McShane, PhD, Mark Hallett, MD

**789 Clinical Trial of Plasma Exchange and High-dose Intravenous Immunoglobulin in Myasthenia Gravis**

Philippe Gajdos, MD, Sylvie Cheuret, MD, PhD, Bernard Clair, MD, Christine Franchant, MD, and Claude Chastang, MD, PhD, for the Myasthenia Gravis Clinical Study Group

**797 Multiple Sclerosis: Re-expression of a Developmental Gene in Chronic Lesions Correlates with Remyelination**

Elisabetta Capello, MD, Rhonda R. Voskuhl, MD, Henry F. McFarland, MD, and Cedric S. Raine, PhD, DSc, FRCPath

## Brief Communications

**806 Human T-Cell Lymphotropic Virus Type I-Associated Facial Nerve Palsy in Trinidad and Tobago**

Courtenay Bartholomew, MD, Farley Cleghorn, MBBS, Noreen Jack, MBBS, Jeffrey Edwards, MBBS, and William Blattner, MD

**809 A Novel Presenilin-1 Mutation: Increased  $\beta$ -Amyloid and Neurofibrillary Changes**

T. Gómez-Isla, MD, PhD, W. Wasco, PhD, W. P. Pettingell, BS, S. Gurubagavatula, MS, S. D. Schmidt, BS, P. D. Jondro, BA, M. McNamara, BA, L. A. Rodes, BA, T. DiBlasi, W. B. Growdon, P. Seubert, PhD, D. Schenk, PhD, J. H. Growdon, MD, B. T. Hyman, MD, PhD, and R. E. Tanzi, PhD

**813 Is There a Genetic Susceptibility Locus for Parkinson's Disease on Chromosome 22q13?**

K. Wilhelmsen, D. Mirel, K. Marder, M. Bernstein, A. Naini, S. M. Leal, L. J. Cote, M.-X. Tang, G. Freyer, J. Graziano, and R. Mayeux

## Expedited Publications

**818 A Double-blind Controlled Study of Gabapentin and Baclofen as Treatment for Acquired Nystagmus**

L. Averbuch-Heller, MD, R. J. Tusa, MD, PhD, L. Fuhry, MD, K. G. Rottach, MD, G. L. Ganser, MD, W. Heide, MD, U. Büttner, MD, R. J. Leigh, MD

**826 Friedreich-like Ataxia with Retinitis Pigmentosa Caused by the His<sup>101</sup>Gln Mutation of the  $\alpha$ -Tocopherol Transfer Protein Gene**

Takanori Yokota, Toshiaki Shiojiri, Takanari Gotoda, Makoto Arita, Hiroyuki Arai, Tatsuhide Ohga, Takashi Kanda, Junichi Suzuki, Tomihiro Imai, Hiroyuki Matsumoto, Seijo Harino, Motohiro Kiyosawa, Hidehiro Mizusawa, and Keizo Inoue

## Letters

**833 Treatment of Parkinson's Disease: Disagreements**  
Michael Schulzer, MD, PhD

**833 Reply**

J. Godbold, PhD, J. Mandeli, PhD, and C. W. Olanow, MD, FRCP(C)

**834 Neuropsychological and Behavioral Changes and Weight Gain after Medial Pallidotomy**

Anthony E. Lang, Andres Lozano, Ronald Tasker, Jan Duff, Jean Saint-Cyr, and Lisa Trépanier

**835 Reply**

Mark S. Baron, MD, Jerrold L. Vitek, MD, PhD, Roy A. E. Bakay, MD, Joanne Green, PhD, Yoshiki Kaneoke, MD, Takao Hashimoto, MD, Robert S. Turner, PhD, John L. Woodward, PhD, Steven A. Cole, MD, William M. McDonald, MD, and Mahlon R. DeLong, MD

## Regular Departments

**837 Books**

## Indexes to Volume 41

**838 Author Index**

**842 Subject Index**